

Reality vs. Expectations:

Why Volatility Control makes
sense in Fixed Indexed Annuities



Introduction

Volatility-controlled index strategies within Fixed Indexed Annuities (FIAs) have been the subject of considerable debate. Critics argue that they introduce unnecessary complexity and have negatively impacted performance. While many of these strategies have underperformed expectations, we contend that the volatility control mechanism itself is not the primary issue. Instead, other features within these strategies have played a more significant role in driving underperformance. Volatility control has the singular aim of mitigating inefficiencies in the option market as they relate to FIA pricing, leading to more stable rates and potentially improved outcomes for policyholders.

This paper explores the relationship between volatility and FIAs, analyzing how fluctuations in volatility impact option costs and therefore participation rates and ultimately credited interest. The dynamics between the volatility cost of index options and the actual realized volatility of the index often results in policyholders receiving less interest than they could have if participation rates were dynamically adjusted.



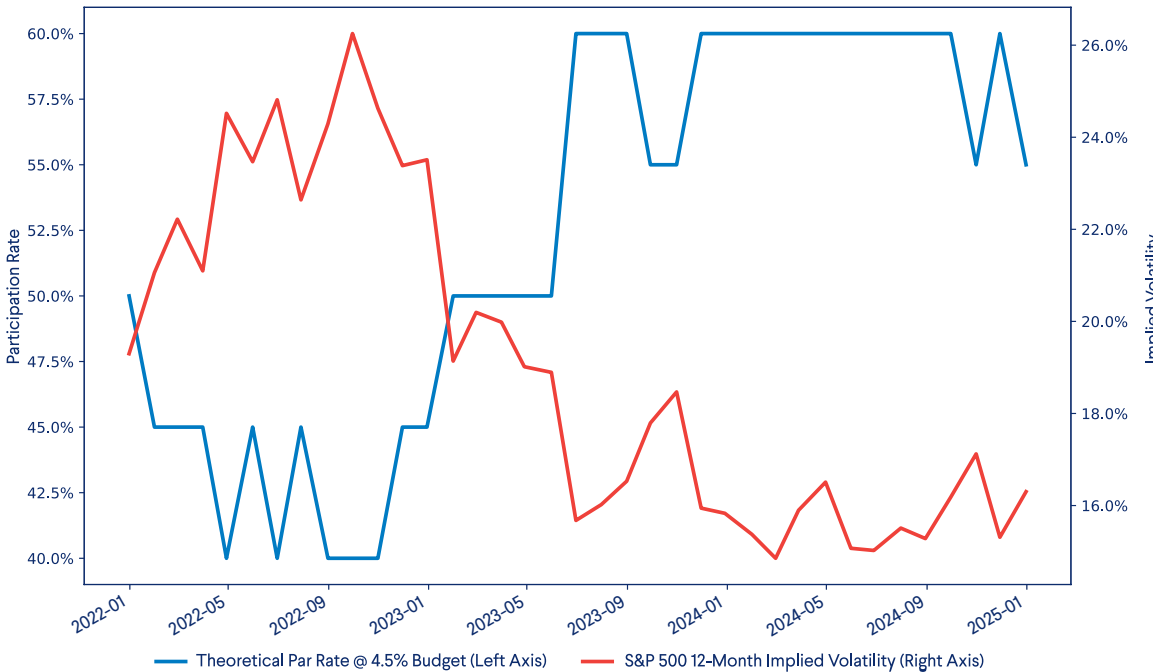
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The relationship between volatility and participation rates

To understand the relevance of volatility control, we must first examine how volatility affects FIA participation rates. A participation rate strategy guarantees a policyholder their principal plus a percentage of an index's return over the contract term. This percentage—the participation rate—is determined by several factors, with the price of options on the underlying index being among the most significant. Option pricing mechanics are beyond the scope of this discussion, but suffice it to say that volatility is one of the main factors affecting prices.

Since higher volatility leads to a higher option price—and participation rates are based on these option prices—there is an inverse relationship between volatility and participation rates. A comparison of S&P 500® implied volatility with the theoretical implied participation rate at a 4.5% option budget demonstrates this inverse relationship.

Par Sensitivity to Implied Volatility



Source: Bloomberg data and Delaware Life analysis. 12/31/2021 – 12/31/2024

This hypothetical example is used for illustrative purposes only. Past performance is not indicative of future results.

The gap between realized and implied volatility

Volatility is simple to measure retrospectively, but options (and FIAs) are issued on a go-forward basis. When option sellers set prices, they do not know what volatility will be in the future, so they rely on estimates. Given the uncertainty of the prediction, these estimates often exceed the actual volatility realized over the contract period.

A March 2024 study in the *Journal of Derivatives*¹ found that the 1-month forward implied volatility (i.e., priced volatility) on the S&P 500®, as measured by the VIX®, is consistently higher than the actual volatility realized over the ensuing 1-month period. While this pattern is occasionally inverted, this tends to come in extreme market conditions—the Great Financial Crisis in 2008 and COVID crash in 2020 are obvious examples—where participation rate may not be top of mind: after all 50% of zero is the same as 100% of zero.

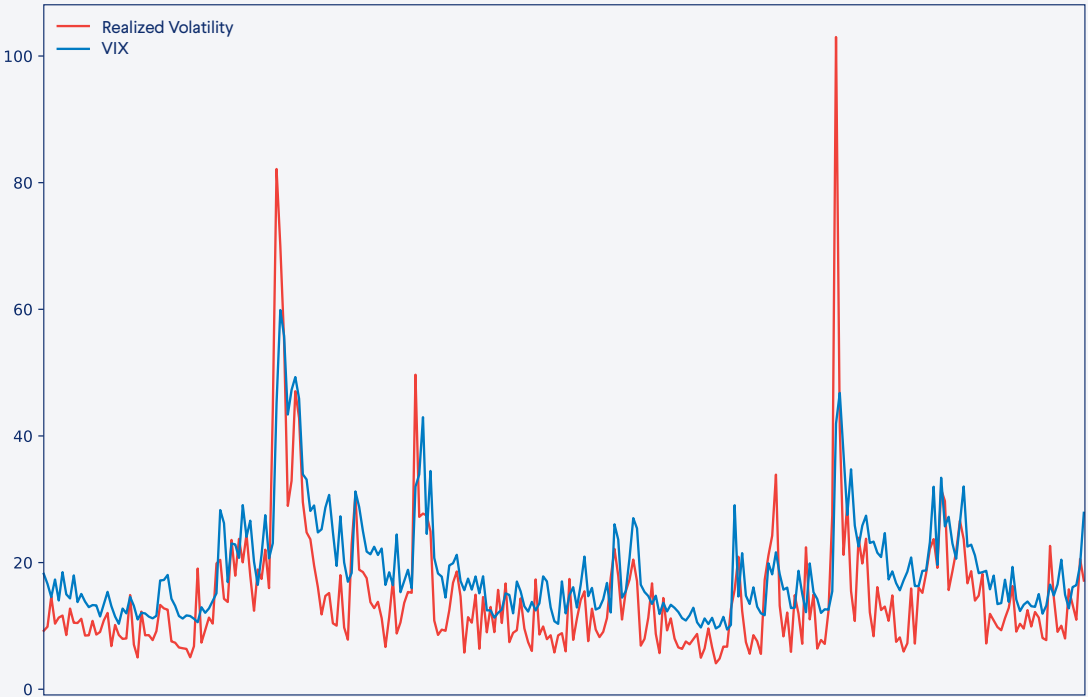
Our own research, *An Index for all Seasons*, examines this pattern over one-year horizons, consistent with the time frame of most FIA contracts, and additionally includes the realized forward one-year S&P 500® returns. A couple of key points are worth reiterating:

- The periods with the highest returns largely correspond to instances where realized volatility was lower than implied volatility. A large majority of the periods lie below and to the right of the 45-degree line in the chart, representing these cases.
- In periods when realized volatility did exceed implied volatility, returns were negative or only slightly positive.

In FIA terms, this means that participation rates were systematically discounted during the best-performing periods. Conversely, when participation rates were higher than realized volatility would indicate, policyholders often received no interest due to poor market performance, negating any theoretical benefit.

¹ Umarov, Lütkebohmert, & Halbleib, 2024

S&P 500® Implied Versus Realized Volatility



Source: Umarov, Lütkebohmert, & Halbleib, 2024

Example recreated by Delaware Life using Bloomberg data.



Source: Bloomberg data and Delaware Life analysis. 09/22/2004 - 02/28/2025

Volatility control: a potential solution

This pricing mismatch is not unique to the S&P 500®, but exists across all exchange-traded index options markets. The necessity to set participation rates in advance based on option prices that are priced at a premium is the problem that volatility-controlled strategies were designed to address.

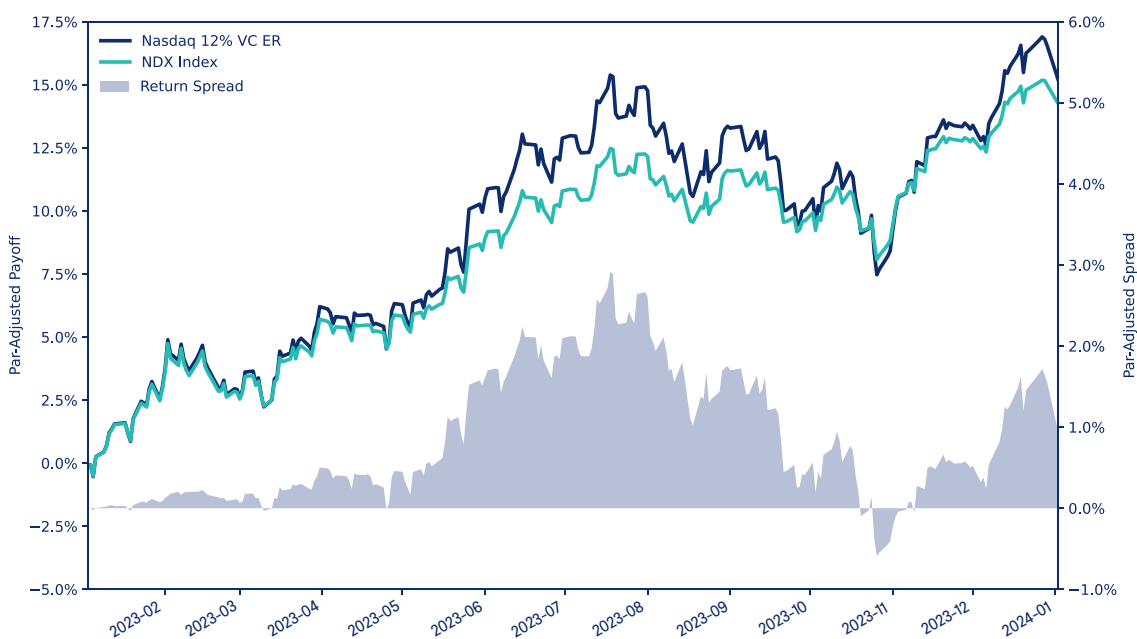
Consider a theoretical 12% volatility-targeted Nasdaq-100 strategy:

Both the volatility-controlled and the standard (“raw”) index strategies have fixed headline participation rates. When a policyholder opts into one of these index strategies, the participation rate they receive is set at the time of purchase. However, the volatility-controlled index incorporates an adjustment mechanism that dynamically modifies effective participation rates in response to actual realized volatility. When volatility declines, the

index increases its exposure to the underlying assets, raising the effective participation rate. In the cases we saw where realized volatility over the holding period was lower than initially estimated, the volatility-controlled index would have adjusted exposure upward, aligning with actual market conditions rather than forecasts.

Looking at the period in the charts, we see that as the trailing volatility of the Nasdaq-100 index declined, the effective participation rate of the volatility-controlled strategy more than doubled compared to the raw index strategy by year-end. Given the coinciding positive performance, this would have resulted in nearly a 2% improvement in credited interest for the volatility-controlled strategy versus the raw index strategy. This during a year where the raw return was 53.8%, which contradicts the notion that volatility control eliminates upside potential.

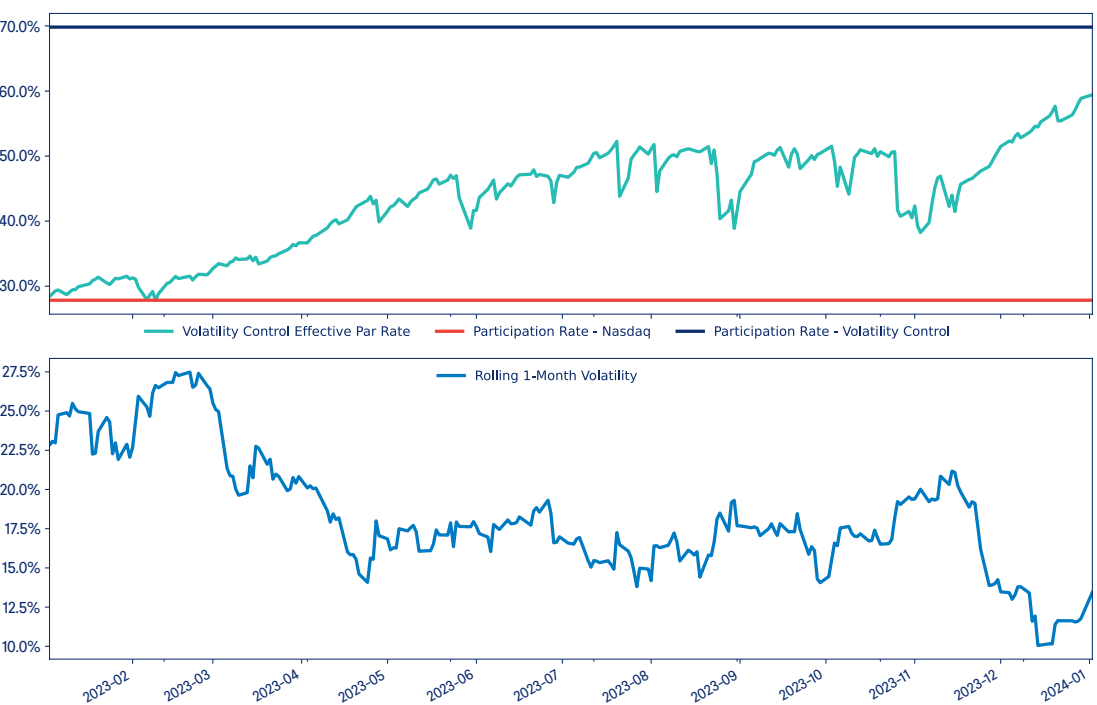
Participation Rate Adjusted Index Payoffs



Source: Bloomberg data and Delaware Life analysis. 12/31/2022 – 12/31/2023

Examples used for illustrative purposes only. Past performance is not indicative of future results.

Effective Participation Rate



Source: Bloomberg data and Delaware Life analysis. 12/31/2022 – 12/31/2023

Conclusion

Volatility control was introduced to address a specific inefficiency in option pricing: the systematic overestimation of implied volatility relative to realized volatility. This discrepancy negatively impacts FIA policyholders by reducing their potential credited interest. Volatility-controlled indexes enable effective participation rates to adjust dynamically in response to actual market conditions, potentially enhancing policyholder outcomes and eliminating the need to preemptively “bet” on volatility levels a year in advance.

It is true that many volatility-controlled indexes have not met performance expectations. However, we argue this is largely attributable to broader market conditions – specifically, the unprecedented period of strong risk-adjusted returns for large-cap U.S. equities – and the inclusion of other strategy features that may have been out of favor.

Rather than fearing volatility-control indexes, investors should recognize that these strategies can be used to enhance FIA returns by adapting to real market conditions and can potentially make a meaningful impact to policyholders.

References

Umarov, J., Lütkebohmert, E., & Halbleib, R. (2024). Exploiting the Gap Between Implied and Realized Volatility. *The Journal of Derivatives*, 12-42.

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